REMARKS/ARGUMENTS

Claims 1-20 were pending in the application. Claims 1, 2, and 4-20 have been withdrawn by the Examiner as being drawn to non-elected inventions following the Restriction Requirement of March 9, 2005. Claims 4-20 have been canceled in view of the Restriction Requirement. Applicants expressly reserve the right to file divisional applications or take such other appropriate measures deemed necessary to protect the inventions in the cancelled claims.

Claims 1-2 have been withdrawn but have not been canceled by Applicants in view of possible later rejoinder under MPEP §821.04. Claim 3 has been amended to be an independent claim and to include the limitations of claim 1 from which it previously depended.

The Rejection of Claim 3 under 35 U.S.C. §112, Second Paragraph, Should Be Withdrawn

The Office Action (April 28, 2005, page 2, #3) rejected claim 3 under 35 U.S.C. §112, second paragraph, as being indefinite because "[i]t is unclear what product limitations result from the process recited in withdrawn claim 1." Applicants respectfully traverse this rejection and request that it be withdrawn.

The current specification describes the superior properties possessed by monolayers formed according to the method of claim 1, for example, in working Example 1 (specification pp. 29-31; see also data shown in Figure 4 and described in the Figure 4 figure legend on specification p. 6). Particularly, the data shown in Figure 4 demonstrate that the monolayers formed by the methods of the invention and claimed in claim 3 confer superior properties on a ligand sensor device coated with them such as the ability to distinguish among different concentrations of ligands and the rapid production of reliable measurements following exposure to a ligand.

Applicants also traverse this rejection because MPEP § 2113 supports the patentability of claim 3. MPEP § 2113 ("Product-by-Process Claims") states, in part:

> The **structure implied by the process steps should be considered** when assessing the patentability of product-by-process claims over the prior art, **especially where the product can only be defined by the process** steps by which the product is made, or where the manufacturing process steps would

> be expected to impart **distinctive structural characteristics** to the final product. See, *e.g.*, *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979)....

Thus, the MPEP specifically recognizes that there will be situations where a product can only be defined by the process steps by which the product is made. The MPEP also recognizes that in some instances, the process of manufacture would be expected to impart distinctive structural characteristics to the final product.

Applicants sincerely believe that the claimed product can only be adequately defined by the process steps by which the product is made. The method specified in the claims provides a unique process of purification in which the monolayer of stripped phage is created on the surface of an aqueous subphase while impurities go into the subphase beneath the monolayer (described in the specification on p. 27, line 16 through p. 28, line 18). As discussed in the specification, monolayers formed by this method provide improved properties to sensors made using them, including improved sensitivity, specificity, and time to equilibrium. However, it is not known exactly why the method results in such improvements. Because the exact basis for the improvements is unknown, these monolayers can only be described as a product of the improved process.

Moreover, according to MPEP 2113 as cited above, when the patentability of product-by-process claims is assessed, the structure implied by the process steps should be considered. As described in the specification (p. 27, lines 17-19), "[t]he monolayers produced by the methods of the invention differ from prior art monolayers in that their components have not been damaged by organic solvents and have undergone self-purification and alignments during formation." Thus, it is believed that the improved properties of the monolayers result from structural properties which are a result of the process used to create the monolayers. Accordingly, Applicants sincerely believe that the product can only be adequately defined by the process steps by which the product is made.

While this rejection of claims was made under 35 U.S.C. §112, second paragraph, Applicants emphasize that the patentability of the current claims is also supported by *In re Edwards*, 568 F.2d 1349 (CCPA 1978), which held that the written description requirement was satisfied by a specification that described a claimed compound by the process by which it was

made because, taken as a whole, the application reasonably led those of skill in the art to the claimed compound.

For the reasons discussed above, Applicants submit that claim 3 is not indefinite and respectfully request that this rejection be withdrawn.

The Rejections of Claim 3 under 35 U.S.C. §102 Should Be Withdrawn

As an initial matter, Applicants note the comment in the Office Action (April 28, 2005, p. 3, last paragraph, to top of p. 4) that each of the references cited as a basis for rejection of claim 3 under 35 U.S.C. §102(b) "teach a monolayer" and that "[i]t is unclear what further product limitations would be provided by the recited method...." Applicants respectfully disagree with this conclusion.

Applicants have amended claim 3 to be an independent claim and to incorporate the limitations of claim 1 from which it previously depended. As is evident from a close reading of the claims, the monolayer of claim 3 is formed, *inter alia*, by providing a composition comprising stripped phage and delivering that composition to a wettable surface so as to form a monolayer on an aqueous subphase. Therefore, Applicants respectfully submit that one of skill in the art will appreciate that the monolayer comprises stripped phage. Accordingly, the claimed invention is not anticipated by references teaching unrelated monolayers, as have been cited in the current Office Action. For this reason, Applicants respectfully request that the rejections under 35 U.S.C. §102(b) be withdrawn. These rejections, and Applicants' responses to them, are discussed in more detail below.

The Office Action (April 28, 2005, page 3, #4) rejected claim 3 under 35 U.S.C. §102(b) as being anticipated by Hengerer *et al.* (1999) *Biosensors & Bioelectronics* 14: 139-144, which is characterized as "teach[ing] a monolayer." Applicants respectfully traverse this rejection and request that it be withdrawn.

Applicants note that the Hengerer reference does not describe or even mention stripped phage for use as a component of a monolayer. Instead, the Hengerer reference describes screening phage libraries using a quartz crystal microbalance (QCM) device in order to identify

recombinant antibodies and mutants of human pancreatic secretory trypsin inhibitor (hPSTI) that bind to an antigen, namely a recombinantly expressed fragment of the major outer membrane protein (MOMP) of *Legionella pneumophila* (on p. 140, column II, first full paragraph). The reference summarizes these studies as follows (p. 140, column I, last full paragraph):

> The combination of phage display techniques and antigen-coated QCM allows the screening of large phage libraries without specifically labeled analytes in contrast to testing by ELISA.

In the Hengerer study, the quartz crystal microbalances were coated with streptavidin and biotinylated MOMP and then used to screen phage libraries for complementary antibodies or "affibodies" (page 140, column II, last paragraph through page 141, column I, first paragraph).

Thus, Hengerer describes the use of sensor devices coated with biotinylated MOMP to screen phage libraries. In contrast, the present invention provides monolayers comprising stripped phage that are created using a particular purification process. Thus, as will be appreciated, the Hengerer reference does not teach or suggest the present invention and therefore it does not anticipate the claimed invention. Accordingly, Applicants respectfully request that this rejection be withdrawn.

The Office Action (April 28, 2005, page 3, #5) rejected claim 3 under 35 U.S.C. §102(b) as being anticipated by Benjamin *et al.* (U.S. Pat. App. 20010006778), which is characterized as "teach[ing] a cell monolayer" in paragraph 0058. Applicants respectfully traverse this rejection and request that it be withdrawn.

As stated in the Benjamin reference's "Summary of The Invention" (paragraph 0005 *et seq.*), the invention "features methods for identifying compounds that bind a target that combine the use of peptide-based libraries with the use of chemically-based libraries...." The Benjamin reference in paragraph 0058 describes a monolayer of cells that express LHRH-R (luteinizing hormone releasing hormone receptor) and their use to identify members of a phage library that bind to LHRH-R.

However, the Benjamin reference does not teach or suggest the claimed invention. Particularly, the Benjamin reference does not teach or suggest a monolayer comprising stripped

phage prepared by a specific purification process as provided in claim 3. Therefore, the Benjamin reference does not anticipate the claimed invention. Accordingly, Applicants respectfully request that this rejection be withdrawn.

The Office Action (April 28, 2005, page 3, #6) rejected claim 3 under 35 U.S.C. §102(b) as being anticipated by Uttenthaler *et al.* (1998) *Analytica Chimica Acta* 362: 91-100. Applicants respectfully traverse this rejection and request that it be withdrawn.

The Uttenthaler reference teaches an immunosensor for the detection of African Swine Fever (ASF) disease in pigs. The immunosensor is coated with the ASF protein VP73. The reference does not discuss the use of phage at all. Further, as shown in Table 1 of the Uttenthaler reference (p. 95, discussed on p. 99, column I, second full paragraph), the optimum incubation period for the VP73 immunosensor is four days. This contrasts with the properties of sensor devices coated with monolayers formed according to the method of claim 1, which provide rapid and reliable measurements as illustrated by working Example 1 (specification pp. 29-31; see also data shown in Figure 4 and described in the Figure 4 figure legend on specification p. 6).

Thus, the Uttenthaler reference does not teach or suggest a monolayer comprising stripped phage prepared by a specific purification process as provided in claim 3. Therefore, the Uttenthaler reference does not anticipate the claimed invention. Accordingly, Applicants respectfully request that this rejection be withdrawn.

The Provisional Rejection of Claims for Nonstatutory Double Patenting Should Be Withdrawn

The Office Action (April 28, 2005, page 4, #7, #8, and #9) has provisionally rejected claim 3 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over: claim 18 of copending App. No. 09/452, 968; claim 20 of copending App. No. 10/068,570; and claims 1 and 3 of copending App. No. 10/289,725. For each provisional rejection, the Office Action states that the claims are not patentably distinct because the monolayer of claim 3 encompasses virtually any monolayer.

Applicants respectfully disagree with this conclusion. As discussed above, claim 3 requires that the monolayer of claim 3 is formed, *inter alia*, by providing a composition comprising stripped phage and delivering that composition to a wettable surface so as to form a monolayer on an aqueous subphase. Therefore, Applicants respectfully submit that one of skill in the art will appreciate that the monolayer comprises stripped phage. Accordingly, the claimed invention is not anticipated by references teaching unrelated monolayers, including those cited in the provisional double-patenting rejection. For this reason, Applicants respectfully request that the provisional double-patenting rejections be withdrawn.

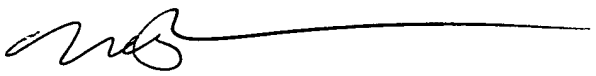
CONCLUSION

In view of the above amendments and remarks, Applicants submit that the rejections of the claims under 35 U.S.C. §§112, second paragraph, and 102(b) are overcome. Applicants respectfully submit that this application is now in condition for allowance. Early notice to this effect is solicited.

If in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject Application, the Examiner is invited to call the undersigned.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those, which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,



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Nora C. Martinez